**LISTING OF CLAIMS**

This listing of claims will replace all prior versions and listings of claims in this patent application:

1. (original) An apparatus for measuring radiant intensity of a photolithographic illumination source in a photolithography projection imaging system, the apparatus comprising:

a plurality of discrete imaging objectives, each capable of imaging to a corresponding field point, thereby imaging a plurality of field points; and

a common imaging surface for the plurality of discrete imaging objectives, wherein each of the plurality of field points is imaged on the common imaging surface;

wherein the discrete imaging objectives have sufficient resolution to permit reconstruction of a radiant intensity profile of the illumination source.

2. (original) The apparatus as defined in Claim 1, wherein the intensity profile is reconstructed from measurement of radiant intensity at the field points.

3. (original) The apparatus of Claim 1, wherein one or more of the discrete imaging objectives comprises a plano convex lens.

4. (currently amended) The apparatus of Claim 1, wherein one or more of the discrete imaging objectives comprises a computer generated hologram element.

5. (original) The apparatus of Claim 1, wherein one or more of the discrete imaging objectives comprises an aspherically corrected lens.

6. (original) The apparatus of Claim 1, wherein one or more of the discrete imaging objectives comprises a computer generated hologram integral with a reticle top surface.

7. (original) The apparatus of Claim 1, wherein one or more of the discrete imaging objectives comprises a micro imaging objective.

8. (original) The apparatus of Claim 1, wherein one or more of the discrete imaging objectives comprises a multi-element imaging objective.

9. (original) The apparatus of Claim 1, wherein one or more of the discrete imaging objectives comprises a reflective computer generated holographic plate.

10. (original) The apparatus of Claim 1, wherein said common imaging surface comprises a reticle face.

11. (original) The apparatus of Claim 1, wherein said common imaging surface comprises a plane located beyond a reticle face.

12. (original) The apparatus of Claim 1, wherein said common imaging surface comprises a plane located before a reticle face.

13. (original) The apparatus of Claim 1, wherein the discrete imaging objectives fit within a reticle/pellicle envelope.

14. (original) The apparatus of Claim 1, wherein the discrete imaging objectives can be placed in an illuminator beamtrain such that the common imaging surface lies at a reticle conjugate imaging plane.

15. (currently amended) The apparatus of ~~Claim 1~~ Claim 1, further comprising a common mounting for the plurality of imaging objectives.

16. (original) The apparatus of Claim 15, wherein the common mounting comprises a projection imaging tool.

17. (original) The apparatus of Claim 15, wherein the common mounting comprises a support plate.

18. (original) The apparatus of Claim 1, wherein the discrete imaging objectives can be placed in an illuminator beamtrain such that the common imaging surface lies at a reticle conjugate imaging plane.

19. (original) A projection imaging system comprising:

an illuminator comprising a light source that generates a radiant intensity profile and produces an illuminator beamtrain;

a multiple field imaging objective in optical communication with the light source;

a projection imaging optic distal the multiple field imaging objective; and

an electronic sensor array, wherein the multiple field imaging objective images the radiant intensity profile onto a plane optically conjugate to the electronic sensor array via the projection imaging optic with sufficient resolution to permit reconstruction of the radiant intensity profile.

20. (currently amended) The apparatus of ~~Claim 19~~ Claim 19, further comprising a reticle table that separates a reticle from the projection imaging optic.

21. (original) The apparatus of Claim 19, wherein the electronic sensor array comprises an imaging optic that relays the plane to the sensor array.

22. (original) The apparatus of Claim 19, wherein multiple field imaging objective comprises a reticle having one or more computer generated holograms written on its face.

23. (currently amended) A projection imaging system comprising:

an illuminator comprising a light source, a reflective substrate, and a reflective reticle, wherein the light source projects a plurality of light rays toward the reflective substrate, which reflects the light rays toward the reflective reticle; and

a multiple field imaging objective in optical communication with the reflective reticle, wherein the plurality of rays are incident on the multiple field imaging objective;

wherein the multiple field imaging objectives have sufficient resolution to permit reconstruction of a radiant intensity profile of the illumination ~~source.~~ source.

24. (original) The projection imaging system of Claim 23, wherein the source image lies in a plane distal to the reticle.

25. (original) The projection imaging system of Claim 23, wherein the reflective substrate comprises a folding mirror.

26. (original) The projection imaging system of Claim 23, wherein the reflective substrate comprises one or more computer generated holograms.

27. (original) The projection imaging system of Claim 26, wherein the reflective substrate comprises at least two computer generated holograms separated by one or more non-reflective regions.

28. (original) The projection imaging system of Claim 23, wherein the reflective reticle comprises a reflective coating with modulated reflectivity.

29. (original) A projection imaging system comprising:

an illuminator comprising a light source, a reflective substrate, and a reflective reticle, wherein an illuminator beamtrain is projected toward the reflective substrate that

includes a multiple in-situ imaging objective, and is reflected toward the reflective reticle; and

a common imaging surface where the radiant intensity of the beamtrain is recorded at multiple field points;

wherein the multiple in-situ imaging objectives have sufficient resolution to permit reconstruction of a radiant intensity profile of the illuminator.

30. (original) A projection imaging system as defined in Claim 29, wherein the in-situ imaging objective is a computer generated hologram.

31. (original) A projection imaging system as defined in Claim 29, wherein the in-situ imaging objective is an asphere.

32. (original) A projection imaging system comprising:

a multiple field imaging objective;

an aperture blade located at a distance that coincides with a reticle conjugate imaging plane associated with the multiple field imaging objective;

a source relay in optical communication with the multiple field imaging objective; and

a reticle;

wherein the source relay optic images the multiple field objective image formed at the reticle conjugate imaging plane onto the reticle with sufficient resolution to permit reconstruction of a radiant intensity profile of an illuminator.

33. (original) The projection imaging system of Claim 32, wherein the multiple field imaging objective comprises multiple elements.

34. (original) A projection imaging system comprising:

a multiple field imaging objective located so that the imaging surface of the multiple field imaging objective coincides with a conjugate imaging plane of a reticle;

an aperture blade located at the reticle conjugate imaging plan;

a source relay optic in optical communication with the reticle so as to relay images of the multiple field imaging objective formed at the reticle conjugate imaging plane onto a substrate with sufficient resolution to permit reconstruction of a radiant intensity profile of an illuminator.

35. (original) The projection imaging system of Claim 34, wherein the multiple field imaging objective comprises multiple elements.

36. (original) A process for measuring the radiant intensity of an illuminator beamtrain in a projection lithography tool comprising:

loading a multiple field in-situ imaging objective with sufficient resolution to permit reconstruction of a radiant intensity profile of an illuminator into the projection lithography tool;

exposing a recording substrate to multiple doses of light through the in-situ imaging objective;

developing the substrate and measuring the substrate to determine exposed regions versus dose; and

reconstructing the radiant intensity profile of the illuminator using the measurements.

37. (original) A process as described in Claim 36, wherein the projection lithography tool comprises a stepper, a one dimensional scanner, a two dimensional scanner, an EUV scanner, an EPL machine, or an image side immersion lens.

38. (original) A process as described in Claim 36, wherein the recording substrate comprises a silicon wafer, a flat panel, a circuit board, or a wafer mounted electronic sensor.

39. (original) A process for measuring the radiant intensity of an illuminator in a projection lithography tool comprising:

exposing a recording substrate with a multiple field in-situ imaging objective with sufficient resolution to permit reconstruction of a radiant intensity profile of an illuminator; and

reconstructing the radiant intensity profile of the illuminator using measurements of the exposed substrate.

40. (original) A process as defined in Claim 39, wherein the substrate is a silicon wafer.

41. (original) A process for measuring the radiant intensity of an illuminator beamtrain in a projection lithography tool, the process comprising:

loading a multiple field in-situ imaging objective with sufficient resolution to permit reconstruction of a radiant intensity profile of an illuminator into the projection lithography tool;

providing an electronic sensing array, wherein the electronic sensing array is in optical communication with the imaging objective;

exposing the electronic sensing array to an illuminator beamtrain through the imaging objective;

recording the electronic sensing array output; and

reconstructing the radiant intensity profile of the illuminator beamtrain using measurements of the sensing array.

42. (currently amended) A process for producing a photolithographic chip mask work from a photolithography projection imaging system, the method comprising:
projecting a desired mask work reticle in the projection imaging system;

measuring the radiant intensity of an illuminator beamtrain in the projection lithography system by performing operations comprising:
loading a multiple field in-situ imaging objective with sufficient resolution to permit reconstruction of a radiant intensity profile of the illuminator beamtrain into a projection lithography tool of the projection imaging system;

exposing a recording substrate to multiple doses of light through the in-situ imaging objective;

developing the substrate and measuring the substrate to determine exposed regions versus dose; ~~and~~

reconstructing the radiant intensity profile of the illuminator beamtrain using the measurements; and

controlling production of chip mask works through adjustment of projection imaging system in accordance with the reconstructed radiant intensity profile of the illuminator beamtrain.

43. (original) A process as described in Claim 42, wherein the projection lithography tool comprises a stepper, a one dimensional scanner, a two dimensional scanner, an EUV scanner, an EPL machine, or an image side immersion lens.

44. (original) A process as described in Claim 42, wherein the recording substrate comprises a silicon wafer, a flat panel, a circuit board, or a wafer mounted electronic sensor.

45. (original) A microelectronic chip production system comprising:
a production system controller that operates the system; and
a photolithographic projection imaging system comprising:

a scanning controller that controls a scanner of the projection imaging system;

a plurality of discrete imaging objectives, each capable of imaging to a corresponding field point, thereby imaging a plurality of field points wherein the plurality of discrete imaging objectives have sufficient resolution to permit reconstruction of a radiant intensity profile of an illuminator;

a common imaging surface for the plurality of discrete imaging objectives, wherein each of the plurality of field points is imaged on the common imaging surface;

a common mounting for the plurality of imaging objectives; and

a process controller that measures radiant intensity of a photolithographic illumination source in the photolithography projection imaging system and adjusts operation of the projection imaging system in accordance with the measured radiant intensity.

46. (original) A method of controlling a photolithographic projection scanner comprising:

exposing a recording substrate with a multiple field in-situ imaging objective wherein the multiple in-situ imaging objectives have sufficient resolution to permit reconstruction of a radiant intensity profile of an illuminator;

reconstructing the radiant intensity profile of the illuminator using measurements of the exposed substrate; and

adjusting the scanner in accordance with the reconstructed radiant intensity profile so as to minimize variations in the radiant intensity profile of the scanner.

47. (original) A method as defined in Claim 46, wherein the substrate comprises a semiconductor wafer.